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WAVE-LENGTHS OF THE PRINCIPAL LINE IN *NOVA AURIGÆ'S*
SPECTRUM.

The table below contains all the wave-lengths of the chief nebula line in *Nova Aurigæ's* spectrum obtained thus far, together with the corresponding velocities of approach in miles per second:

Date.	W.-L.	Velocity.
1892, Aug. 20	5003.6	— 128
21	3.7	125
22	3.7	125
23	3.1	147
30	2.4	173
Sept. 3	2.4	173
4	1.9	192
6	2.1	184
7	1.9	192
15	2.2	180
22	2.5	169
Oct. 12	3.6	128
19	3.8	121
Nov. 2	4.4	99
3	4.7	87
9	4.4	99
16	4.9	80
17	4.9	80
24	4.5	95
1893, Feb. 10	6.2	30
14	6.1	33
27	5.7	51
Mch. 26	5.2	69
May 9	5.3	65
Aug. 6	6.0	41
Sept. 1	5.6	55
Oct. 10	6.1	— 36

W. W. C.

RESEARCHES UPON COMET 1889, V.

Dr. CHARLES LANE POOR's mathematical discussion of the orbit of Comet 1889 V, recently published in *The Astronomical Journal* shows it to be an orbit of unusual interest. This comet

was discovered by BROOKS in July, 1889. Dr. CHANDLER found that it was then moving in a small elliptic orbit whose period was a little more than seven years, and pointed out that in 1886 it passed so closely to the planet *Jupiter* that its orbit must have been radically changed. By eliminating the action of *Jupiter* in 1886, Dr. CHANDLER concluded that *before* 1886 the comet moved in a large ellipse whose period was about twenty-seven years. It also appeared that there must have been a very close approach to *Jupiter* in 1779. Now LEXELL's periodic comet 1770 II was not seen *after* the year 1770, presumably for the reason that in 1779 it approached *Jupiter* more or less closely, and its orbit probably underwent considerable change. Dr. CHANDLER compared the orbit of the lost LEXELL comet *after* 1779 with that of Comet 1889 V *before* 1886, and found "an overwhelmingly strong presumption in favor of the identity of the two comets."

Dr. CHANDLER's interesting results were published in November, 1889, a year before the comet was lost to sight. Dr. POOR's computations are based upon the completed observations.

In regard to the near approach of the comet to *Jupiter* in 1886, Dr. POOR finds that "the comet not only passed through the system of *Jupiter's* satellites, but it actually passed within the orbit of the first satellite, whose mean distance is 5.93 radii of the planet. * * * We are safe in saying that the comet passed the center of *Jupiter* at a distance not greater than 3.63 and not less than 1.00 radii of the planet. In other words, the center of the comet may have touched the surface of *Jupiter*, and it certainly approached that surface to within 2.63 radii of the planet, or only 112,300 miles. Even this latter is a very small quantity.

"For the most probable hypothesis, * * * the comet was 2.65 days within the system of *Jupiter's* satellites, and during this time it made nearly a complete circuit about the planet, passing over an arc of 313° of longitude. The comet entered the Jovian system in longitude 118° on July 18.77, passed the planet on July 20.10 at a distance of only 2.28 radii, and July 21.43 left the system in longitude 71° . During this time it must have collided with one or more of the satellites."

Dr. POOR finds that the period of the comet, previous to 1886, was between the limits 32.60 and 30.17 years. Now LEXELL's lost comet was disturbed by *Jupiter* in 1779 in the

same part of *Jupiter's* orbit that the planet and Comet 1889 V were in July 20, 1886. The interval between these disturbances is 107 years. The period of Comet 1889 V being about 31 years, which is not an aliquot part of 107, that comet could not have been near *Jupiter* in 1779, unless it suffered other and serious disturbances in the intervening years. Such disturbances did take place in 1827 and 1791, but they were of such a nature as to leave very serious doubts whether the comet was near *Jupiter* in 1779, a condition absolutely necessary to establishing the identity of the two comets.

Dr. POOR concludes that the vexed question of identity cannot now be answered, but we must await further observations of the comet at its reappearance in 1896. He promises in another paper to discuss the question of the disruption of the comet while in *Jupiter's* system, and of the possibility of a portion of it being permanently drawn into the system to form a new satellite.

W. W. C.

THE PARALLAX OF THE PLANETARY NEBULA DM.

+ 41°, 4004.

Dr. J. WILSING, of the Potsdam Astro-Physical Observatory, has determined the parallax of WEBB's planetary nebula DM. + 41°, 4004 by the photographic method. From June, 1892, to June, 1893, 102 exposures of eight minutes each were made on the region of the nebula. The distances of the nebula from two eleventh magnitude stars were accurately obtained from all the plates, and a combination of the data gave as the most probable value of the parallax of the nebula relative to one of the stars

$$\pi = - 0''.08;$$

and relative to the other star

$$\pi = - 0''.17.$$

The fact that the relative parallax comes out negative indicates that the distance of the nebula from our solar system is probably greater than that of the two eleventh magnitude comparison stars.

This is the first nebula parallax to be investigated photographically. Dr. WILSING's paper is published in *Astronomische Nachrichten*, No. 3190.

W. W. C.